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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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The Law Offices of John C. Scott, LLC
c/o PortfolioIP
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER	
TORRES, JOSEPH D	
ART UNIT	PAPER NUMBER
2112	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/815,133	XIA ET AL.	
	Examiner	Art Unit	
	Joseph D. Torres	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2009*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4, 6, 10-16, 18, 20, 21 and 30-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *34-38* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *1-4,6,10-16,18,20,21 and 30-33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1, 15, and 30 are objected to because of the following informalities: claims 1, 15, and 30 refer to elements, such as Appendix A, not having antecedent basis in the claims as pointed out in the last Office Action. 37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". **The term "*independent claim*" makes clear what is meant by "a claim may not contain any other parts of the application or other material". A claim can hardly be considered independent if it depends form other materials**. MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims".

In the Appeal Brief filed 02/02/2009, the Applicant makes clear that the Applicant considers the list file for the particular matrix of the Applicant's Appendix A the only distinguishing feature for claims 1, 15, and 30 for the Prior Art of Record. The material in the Applicant's Appendix A is a standard text list file and presents no problem to the Office, if it is included in the claims. Furthermore, the Applicant has already

demonstrated that it is not a problem for the Applicant to include the text list file of Appendix A in the claims since the Applicant has done so for claim 34.

Since the text list file of Appendix A is the only distinguishable feature in claims 1, 15, and 30 it does not detract from anything else that may be recited in claims 1, 15, and 30. In fact, the rest of the Prior Art subject matter in claims 1, 15, and 30 detract from the relative importance of text list file of claim A, if the text list file of Appendix A is not present since the text list file of Appendix A is the only distinguishing feature of the claims (see Reasons for Allowance, below). Since it is not a problem for the office to publish claims 1, 15, and 30 with the text list file of Appendix A inserted into the claims; since it is not a problem for the Applicant to insert the text file; and since the test file is a critical feature of the claim (the only distinguishing feature of the claim), the text list file of Appendix A must be inserted into claims 1, 15, and 30.

Allowable Subject Matter

Claims 1-4, 6, 10-16, 18, 20, 21 and 30-33 are objected to as being dependent upon Appendix A in the specification, but would be allowable if rewritten in independent form including all of the limitations of Appendix A.

Claims are 34-38 allowed.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Claims 1 is directed to A wireless apparatus comprising: a forward error correction (FEC) coder to encode digital data using a low density parity check (LDPC) code, said FEC coder including: a computer readable storage medium storing at least a first portion of a parity check matrix, and said first portion includes at least half of said parity check matrix; a matrix multiplication unit to multiply input data by a transpose of said first portion of said parity check matrix to generate modified data; a differential encoder to differentially encode said modified data to generate coded data; and a concatenation unit to concatenate the input data and the coded data to form a code word; and a wireless transmitter to transmit a wireless signal that includes said code word.

The Prior Art of Record, and in particular (Yang and Lu, see Final Rejection filed 04/03/2008),teach a forward error correction FEC coder to encode digital data using a low density parity check LDPC code (Figure 1(a) on page 1420 in Yang), said FEC coder including: a matrix multiplication unit to multiply input data by a transpose of a first portion of a parity check matrix to generate modified data (H_1^T block in Figure 1(a) on page 1420 in Yang and Equation 4 on page 1418 of Yang); a differential encoder to differentially encode said modified data to generate coded data ($\frac{1}{1 \oplus D}$ block on pager 1420 of Yang; also see last two paragraphs on page 1419 of yang); and a concatenation unit to concatenate the input data and the coded data to form a code word (Figure 1(a) on page 1420 in Yang teaches that a codeword c is comprised of the input bits concatenated with the parity bits, which clearly suggests a concatenation unit).

Lu, in an analogous art, teaches use of a wireless transmitter to transmit a wireless signal that includes said code word (Abstract in Lu). Lu teaches that use of LDPC coding for wireless OFDM systems can significantly improve system performance by exploiting both spatial diversity and selective fading diversity (Abstract in Lu). The Top of column 2 on page 74 in Lu teaches that antenna array spatial diversity and channel coding can provide significant capacity gains in wireless communications.

Yang and Lu teach each and every element of claim 1 except the Applicant's specific embodiment of the parity check matrix $H= [H_1 T]$ (on page 1418 of Yang) represented by the text list file of Applicant's Appendix A. Since matrices are elements of an existing abstract algebra, discovering a matrix does not constitute an invention. Using a matrix in a generic method and apparatus such as the one taught by Yang and Lu that is designed for any arbitrary parity check matrix $H= [H_1 T]$ does not constitute an invention. Use of a particular parity check matrix $H= [H_1 T]$ such as the parity check matrix represented by the text list file of Applicant's Appendix A in the device and/or apparatus of Yang and Lu only constitutes an invention, if the particular parity check matrix imparts some structural change to the apparatus, for example, of claim 1. Nowhere does claim 1 recite any distinguishing structural features that distinguish claim 1 from the Prior Art, Yang and Lu. The Applicant's Appeal Brief filed 02/02/2009, recites that use of the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts a structural difference to the Apparatus of Yang and Lu without saying what that structural difference is and without showing any support for such structural differences in the specification. Figure 1(a) on page 1420 in Yang

indicates that the encoder is designed for an arbitrary kx(n-k) encoder, which must accommodate any kx(n-k) portion H_1. Despite the Examiner's reservations; since the bounds of the invention are clearly presented in the record and to relieve the USPTO of the unnecessary burden of Appeal: the Examiner places the burden of demonstrating what structurally distinguishing features, taught in the specification, the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts on the Prior Art by allowing the case and leaving it to the Applicant to demonstrate in future litigation should it arise.

As per claim 15: Yang and Lu teach each and every element of claim 15 except the Applicant's specific embodiment of the parity check matrix $H= [H_1 T]$ (on page 1418 of Yang) represented by the text list file of Applicant's Appendix A. Using a matrix in a generic method and apparatus such as the one taught by Yang and Lu that is designed for any arbitrary parity check matrix $H= [H_1 T]$ does not constitute an invention. Use of a particular parity check matrix $H= [H_1 T]$ such as the parity check matrix represented by the text list file of Applicant's Appendix A in the method of Yang and Lu only constitutes an invention, if the particular parity check matrix requires some additional step for the method of claim 15. Nowhere does claim 15 recite any distinguishing step that distinguish claim 15 from the Prior Art, Yang and Lu. The Applicant's Appeal Brief filed 02/02/2009, clearly suggests that use of the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts a distinguishing step limitation to the mehtod of Yang and Lu without saying what that distinguishing step limitation is and without showing any support for such distinguishing step limitation in the specification.

Figure 1(a) on page 1420 in Yang indicates that the encoder is designed for an arbitrary kx(n-k) encoder, which must accommodate any kx(n-k) portion H_1. Clearly, a particular parity check matrix provides no distinguishing features for encoder method taught in Yang. Despite the Examiner's reservations; since the bounds of the invention are clearly presented in the record and to relieve the USPTO of the unnecessary burden of Appeal: the Examiner places the burden of demonstrating what distinguishing step limitations, taught in the specification, the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts on the Prior Art by allowing the case and leaving it to the Applicant to demonstrate in future litigation should it arise.

As per claim 30:

Yang, Lu and Brankovic teach each and every element of claim 30 except the Applicant's specific embodiment of the parity check matrix H= $[H_1\ T]$ (on page 1418 of Yang) represented by the text list file of Applicant's Appendix A. Since matrices are elements of an existing abstract algebra, discovering a matrix does not constitute an invention. Using a matrix in a generic method and apparatus such as the one taught by Yang and Lu that is designed for any arbitrary parity check matrix H= $[H_1\ T]$ does not constitute an invention. Use of a particular parity check matrix H= $[H_1\ T]$ such as the parity check matrix represented by the text list file of Applicant's Appendix A in the device and/or apparatus of Yang and Lu only constitutes an invention, if the particular parity check matrix imparts some structural change to the apparatus, for example, of claim 30. Nowhere does claim 30 recite any distinguishing structural features that distinguish claim 30 from the Prior Art, Yang and Lu. The Applicant's Appeal Brief filed

02/02/2009, recites that use of the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts a structural difference to the Apparatus of Yang and Lu without saying what that structural difference is and without showing any support for such structural differences in the specification. Figure 1(a) on page 1420 in Yang indicates that the encoder is designed for an arbitrary kx(n-k) encoder, which must accommodate any kx(n-k) portion H_1. Despite the Examiner's reservations; since the bounds of the invention are clearly presented in the record and to relieve the USPTO of the unnecessary burden of Appeal: the Examiner places the burden of demonstrating what structurally distinguishing features, taught in the specification, the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts on the Prior Art by allowing the case and leaving it to the Applicant to demonstrate in future litigation should it arise.

As per claim 34:

First of all, the title, as set forth in the claim, fails to identify an article of manufacture and the drawing disclosure does not inherently identify the article in which the design is embodied. *Ex parte Strijland*, 26 USPQ2d 1259, 1263 (Bd. Pat. App. & Int. 1992).

Second of all, Attention is directed to the fact that design patent applications are concerned solely with the ornamental appearance of an article of manufacture. The functional and/or structural features stressed by applicant in the papers are of no concern in design cases, and are neither permitted nor required. Function and structure fall under the realm of utility patent applications.

Since the Applicant at most teaches a computer implemented method in the specification and since the body of claim 34 only recites method steps, claim 34 appears to be directed to a computer implemented method reciting substantially the same steps as claim 15.

Hence, Yang and Lu teach each and every element of claim 34 except the Applicant's specific embodiment of the parity check matrix $H= [H_1 T]$ (on page 1418 of Yang) represented by the text list file of Applicant's Appendix A. Using a matrix in a generic method and apparatus such as the one taught by Yang and Lu that is designed for any arbitrary parity check matrix $H= [H_1 T]$ does not constitute an invention. Use of a particular parity check matrix $H= [H_1 T]$ such as the parity check matrix represented by the text list file of Applicant's Appendix A in the method of Yang and Lu only constitutes an invention, if the particular parity check matrix requires some additional step for the method of claim 34. Nowhere does claim 34 recite any distinguishing step that distinguish claim 34 from the Prior Art, Yang and Lu. The Applicant's Appeal Brief filed 02/02/2009, clearly suggests that use of the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts a distinguishing step limitation to the mehtod of Yang and Lu without saying what that distinguishing step limitation is and without showing any support for such distinguishing step limitation in the specification. Figure 1(a) on page 1420 in Yang indicates that the encoder is designed for an arbitrary kx(n-k) encoder, which must accommodate any kx(n-k) portion H_1. Clearly, a particular parity check matrix provides no distinguishing features for encoder method taught in Yang. Despite the Examiner's reservations; since the bounds of the invention are

clearly presented in the record and to relieve the USPTO of the unnecessary burden of Appeal: the Examiner places the burden of demonstrating what distinguishing step limitations, taught in the specification, the particular parity check matrix represented by the text list file of Applicant's Appendix A imparts on the Prior Art by allowing the case and leaving it to the Applicant to demonstrate in future litigation should it arise.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

This application is in condition for allowance except for the following formal matters:

The text list file of Appendix A must be substituted into claims 1, 15, and 30.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 25 USPQ 74, 453 O.G. 213, (Comm'r Pat. 1935).

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott T. Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joseph D Torres
Primary Examiner
Art Unit 2112

/Joseph D Torres/
Primary Examiner, Art Unit 2112